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The DRILLER

THE JOHN CRERAR
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"Clamping Down . . ." Erhard, one of the Wagner Brothers of Calvary, Wis., is shown putting on a drive clamp while drilling a six-inch cottage well with his 22-W north of Fond du Lac.

FOR MONTH OF
DRILLER
U.S. POSTAGE

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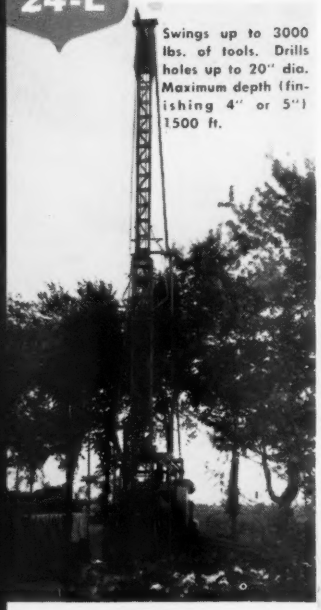
VOLUME 20 NOVEMBER, 1946 NUMBER 11

THREE ROUTES *to Bigger Well Profits*

No matter how expertly it is designed, no machine can i
itself make a drilling business successful. There is no sub
stitute for knowledge of formations or for drilling exper
ence. But added to such knowledge and such experienc
high quality equipment does much to make well profi
soar. Check with the outstandingly successful drillers ever
where and you will be amazed at the high percentage
them who operate Bucyrus-Erie rigs exclusively. They'll b
quick to tell you that a substantial part of their succe
is directly attributable to the hard hitting, long life dri
ing performance of their machines . . . . that Bucyrus-Eri
are routes to bigger profits!

BUCYRUS ERIE 24-L

Swings up to 3000 lbs. of tools. Drills holes up to 20" dia. Maximum depth (finishing 4" or 5") 1500 ft.



BUCYRUS ERIE 22-W

Swings 1500 lbs. of tools. Drills 4" to 10" holes. Maximum depth (4") 1000 ft.

BUCYRUS ERIE 21-W

Swings 1000 lbs. o
Drills 4" to 8" hole
mum depth (4")

Drilling and Fishing Tools

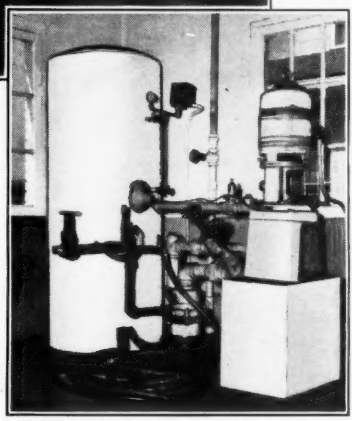
- Finest Workmanship
- A Complete Line
- Prompt Service
- Best Material

16W45

BUCYRUS-ERIE CO.

SO. MILWAUKEE, W
EVANSVILLE, INDIA

A Group of Buildings at Isaly Dairy Farms



The 2 H. P. Deming Jet Water Systems of 1000 G. P. H. Capacity at Isaly's Dairy Farms in Ohio

A "Sample"

OF FUTURE SALES OPPORTUNITIES *for DEMING DISTRIBUTORS*

Alert well drillers who sell Deming Pumps and Water Systems are in the strongest position to cash in on the bigger sales to customers who buy the equipment for profit reasons.

An example of this type of customer is Isaly Dairy Farms in Ohio where an 8 inch well, 85 feet deep and a Deming 2 H. P. Jet Pump of 1000 G. P. H. capacity with a large pneumatic tank carrying 60 lbs. pressure was installed.

In addition to saving about 1450 hours a year on labor, the Deming Water System and drinking cups for the stock increased milk production 15%. This means approximately $3,200.00 more profit on milk production a year for Isaly Dairy Farms.

That's the kind of an installation every alert well driller likes to make: *bigger profits for both himself and his customer.*

Sell DEMING for better profits and satisfied customers!

DEMING

THE COMPLETE LINE

PUMPS AND WATER SYSTEMS

THE DEMING CO. · SALEM, OHIO

• The Childress casing crew composed of Howard Little (left) and Lee, Jr. (both 15 years of age) is shown with the 24-L on a 15½-inch hole for Silver City, N. M. 580 feet of 12-inch casing was placed in this well.

Drilling In New Mexico
Has Its Headaches

• Childress is pictured with his Keystone No. 3 rig on a job for the Adobe Ranch. The well was finished at 1077 feet and took 1018 feet of 19-pound casing.

LEE R. CHILDRESS has lost his hat and occasionally his "pants" while drilling in New Mexico's lava rock country. But while wrestling with difficult formations and trying conditions for the past 18 years, he has built an enviable reputation for himself as an outstanding driller.

Working out of Silver City and covering the surrounding territory of southwest New Mexico, Childress has had many interesting and varied experiences in connection with his contracting jobs. Take the time he lost his hat. He was drilling a ranch well west of the Gila River with his Bucyrus-Erie 24-L and was down

Drilling in New Mexico's lava rock country presents many tough and unusual problems, but Lee R. Childress has conquered enough of Nature's obstacles to rank as an outstanding driller in his territory.

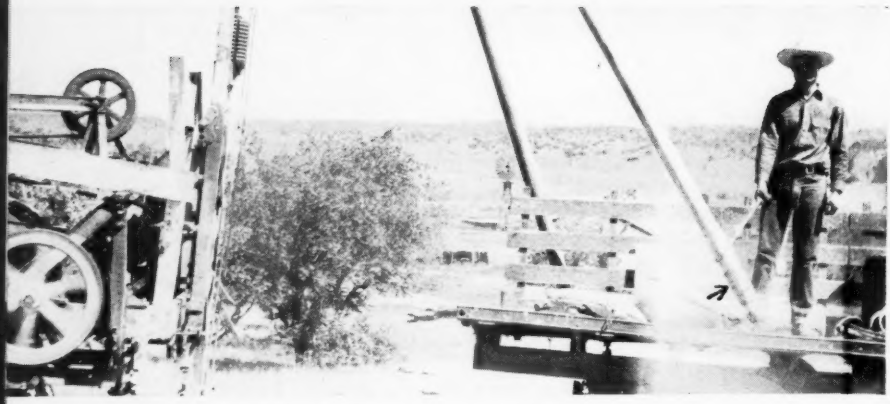
about 200 feet in lava rock when a particularly obstinate boulder was encountered.

The eight-inch bit began sloping off, so Childress tossed in some parts of an engine motor block to act as fill and keep the bit in line. The pounding of the bit against the metal created a spark which ignited gas that had formed at the bottom of the hole. The result was an unexpected explosion that blew the hat off the startled driller's head and stung his arm with gravel.

Fortunately, Childress was more scared than hurt, and after brushing himself off he returned to the job with his accustomed vigor. The job was completed without further incident and the well was finished at a depth of 375 feet, producing 18 gpm. As this was the eighth well put in by Childress for this same client, the Moon Ranch, he had not been totally unaware of the peculiarities of the ground formations in that section.

He had noticed before that the wells seemed to "breathe." That is, air would be drawn into the wells for a period of time and then it would rush out with considerable force. This change was by no means rapid as some of the wells would "in-

(Right) Howard and Lee, Jr. tighten casing with a Dunn casing tong. (Below) Lee, Sr. stands beside a 15½-inch bit weighing 1050 pounds with which he drilled a 547-foot municipal well. The tools without jars totaled 2320 pounds. The well produced 150 gpm.



• A handy gadget for loading drill stems onto the truck is this "boot" with a roller on the end. After the drill stem is fitted into the "boot" it can quickly and easily be stowed. Proud of his little kink, Childress affirms that it is not only easy to load the stem, but that less damage is done to the truck bed. Lee's nephew, Richard, is shown illustrating the procedure.

hale" in the evenings and "exhale" in the mornings. As yet, Childress has had no satisfactory explanation for this phenomenon.

The official name of Lee's business is Lee R. Childress & Son, the son being sixteen year old Lee, Jr. who has been helping his father on his school vacations in the summer, and according to Lee, Sr., the younger member of the firm has been a big help and has the makings of a real driller.

Most of the Childress jobs are stock wells and they vary in size from six to ten inches in diameter and total around 3000 feet in depth during the average year. A Keystone No. 3 rig was standard equipment with him until two years ago when he purchased a Bucyrus-Erie 24-L.

Besides the hard lava formations west of the Gila, Lee has run into a lot of conglomerate and hard granite. The conglomerate consists of hard rock in concrete form and as a rule this formation does not contain great quantities of water, though good stock wells can sometimes be put down in it at a depth from 100 to 700 feet. Childress also adds that he has found some very good wells in ledges of decomposed granite and in diarite dikes, the dikes having been fractured, allowing the water to enter.

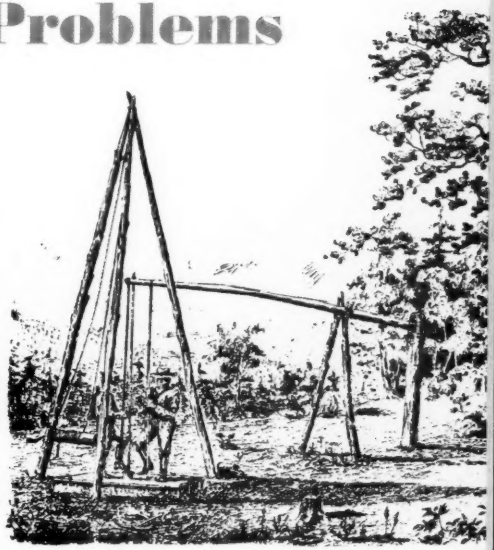
(Continued on page 14)

• Besides drilling wells, Childress has installed over 100 windmills in his area. Here he is shown erecting a windmill on the Moon Ranch with the aid of his rig.

The Early Settlers Had Water Problems

The early pioneers' struggles and hardships to secure potable water for their communities played an important part in the building of a nation. Present day drillers should find this tale both interesting and informative.

"From THE SOD-HOUSE FRONTIER by Everett Dick, copyright, 1937, by D. Appleton-Century Company, Inc., reprinted by permission of the publisher."



• Pioneers made use of this primitive well-drilling unit.

THE first settlers who located in the valleys got their water from springs, or from the running streams. Often the women folk had to carry the water long distances from springs or neighbors' wells. One lady mentioned sinking some salt barrels in the ground near the river. The barrels soon filled with water and if they were dipped dry, they filled up again overnight. Shallow wells, 20 to 30 feet deep, usually provided an abundance of water. It was different on the ridges and high table-lands, however. Water was not to be had closer than a hundred feet and frequently it was two hundred. The buffalo wallows held the water from rains. This water, although it was warm and distasteful, was used to drink. Ponds were made but the water they held was no more palatable than that in the buffalo wallows, however, for it was filled with snakes, bugs, frogs, and larvae of various sorts. Cisterns were dug in draws or bordering lagoons. Many people hauled water from some distance and the old water barrel was a well-known institution. It stood in front of the house and supplied the household. In the summer its water became warm and insipid. In the winter it was taken in the house to keep it from freezing solid.

Hauling water in barrels occupied much of the early settler's time. If water was near at hand, a barrel was placed on a "lizard" or sled. If it was farther away, two or three barrels were placed in a wagon. The barrels were the ordinary wooden kerosene variety. To keep the water from slopping out, the top hoop was taken off, a cloth placed over the barrel, and the hoop driven back on again.

According to the custom of the

• This drive well was invented in 1861 and was then adopted for use by the U. S. Army.

time when a man wanted to dig a well he secured the services of a water witch to locate a vein of water. Usually in every vicinity there dwelt an individual who claimed to be able to "locate" water. This individual was sought far and wide to render this important service. The water witch secured a forked stick of willow or peach, and grasping its ends firmly, he held his hands against his knees, stooped low, and proceeded to walk back and forth over a given locality in which the settler hoped to sink a well. Usually in a certain area the divining rod showed activity and at a particular spot the main stem of the rod inclined unmistakably to the ground. This marked the spot where a good vein of water would be struck.

Worked Together

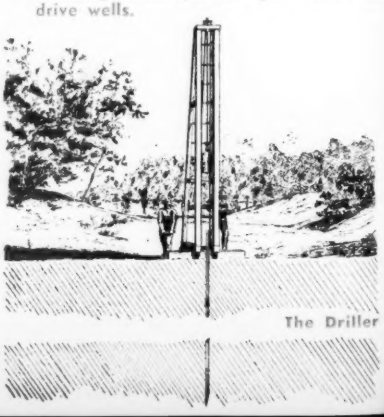
To put down a well two neighbors often helped one another. The equipment needed was a rope, log windlass, and two iron bound buckets. In some parts of the country strata of rocks made blasting necessary. One of the great dangers of well digging was from damp. There were two kinds of damp: black damp and fire damp. Damp was simply a heavier than air gas which gathered in the bottom of the well and overcame the digger.

In one instance a man and his wife in Dakota Territory were digging a well. The man was lowered into the well in the morning; after some little time his wife noticed that all was not well and that he had been overcome. Help was summoned and she went to her husband's aid. Soon it was noticed that the woman had been stooping motionless over the prostrate form of her husband for some time. Another person was sent down. This time the precaution was taken to fasten the rope to the waist of the rescuer. He fastened ropes to the others and they were brought to the top. Every effort was made to resuscitate the suffocated ones but all in vain. Another tragedy was added to the long list of casualties in the conquest of the prairies.

Frontier Tragedy

In August, 1870, a certain Mr. McKinley was digging a well one and one-half miles west of Belleville, Kansas. The well was forty feet deep. At noon when he did not return home for lunch Mrs. McKinley went to look for him. Seeing him prostrate in the bottom of the well and thinking he had fallen, she called a neighbor and went down into the well. When help arrived, she was found motionless stooping over him. She

• Using hand-operated pile driver to drive wells.



• Early model steam outfit.

died before she reached the top, making another double tragedy in the warfare man waged against nature.

Scores of heroic deeds were wrought in digging wells on the high table-lands. Sheet water was to be found at a depth of two to three hundred feet and since the settlers had no money to pay for drilled wells, many were dug to that great depth. In 1918 the Nebraska State Historical Society received a pick and shovel used for more than thirty years by Nels Christensen in digging wells on the high table-lands between Niobrara and Lodge Pole. He had dug more than two miles of wells, perpendicular measure, with these tools. Digging wells at this depth carries with it a heroism equal to service on the battlefield. Once Mr. Christensen was at the bottom of a well two hundred and eighty feet down when the rope broke with a bucket of dirt near the top. Noticing what had happened he straightened up as flat as possible against the side of the well; the falling bucket shaved the skin from his nose, tore the clothing and skin from his chest, and landed with a terrific thud at his feet. The man on top, certain that his partner was dead, left the windlass and ran to get a neighbor to help get the corpse out. When he returned, he was astounded to hear Christensen calling from the depths of the earth.[1] Not a few of these heroes of the deep well-digging business were smothered by cave-ins.

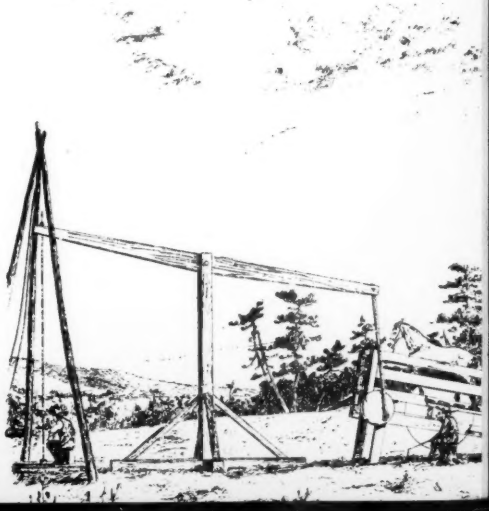
These deep-dug wells not only proved dangerous for diggers and repair men, but occasionally those on deserted claims became death traps for the passer-by who happened to stray into them at night. The homesteader, having been driven from his claim by hard times, often took no particular pains about protecting the passer-by, and the luckless man or beast who on a dark night fell into the depths of one of these wells, was unfortunate indeed.

In Custer County, Nebraska, F. W. Carlin, while driving through the country about fifteen miles north of Broken Bow, found he had taken the wrong road and driven up to some old sod buildings; he turned the team around and started on what

(*Continued on page 17*)

[1] *Nebraska History and Record of Pioneer Days* (Lincoln, Nebraska, n.d.), Vol. II, No. 3, p. 7.

• "Old Dobbin" operated this unique horse-power rig.



The DRILLER

A JOURNAL FOR WATER WELL DRILLERS

Published every month by:
Excavating Engineer Publishing Co.
South Milwaukee, Wisconsin

Single copies 25 cents
Subscription price $1.00 per year
Canada and Foreign. $2.00 per year.

E. M. Heuston, Publisher
D. B. Reed, Jr., Managing Editor
M. B. Jaeger, Editor
G. M. Butler, Associate Editor
M. J. Bargenquest, Asst. Sales Manager

Consulting Editors
G. R. Watson **W. J. Walsh**

Address Communications to:
The Driller, South Milwaukee, Wis

Vol. 20 November, 1946 No. 11

Slight Change In Water Levels Noted

GROUND-WATER conditions changed very slightly during the month of August as water levels in the Eastern States were normal or above, while tables in Southern Arizona and New Mexico continued abnormally low with little or no improvement noted according to the recent bulletin of the U. S. Geological Survey.

Five test well observations in Maine showed levels were at or above normal while in North Carolina a substantial recession was noticed in a well at Blantyre which still remained two feet above normal due to the above average amount of precipitation during the first half of the water year.

The month's entire water-supply picture was featured by notable contrasts of deficient runoff in several widely separated regions and floods and excessive runoff in other areas. Although several index streams in New England posted new high records for the month, no new low-flow records were established.

Albert Goldbeck

1877-1946

Wisconsin well drillers were grieved to learn of the death of Albert Goldbeck, pioneer Badger contractor of Appleton, who passed away September 27 at the age of 69.

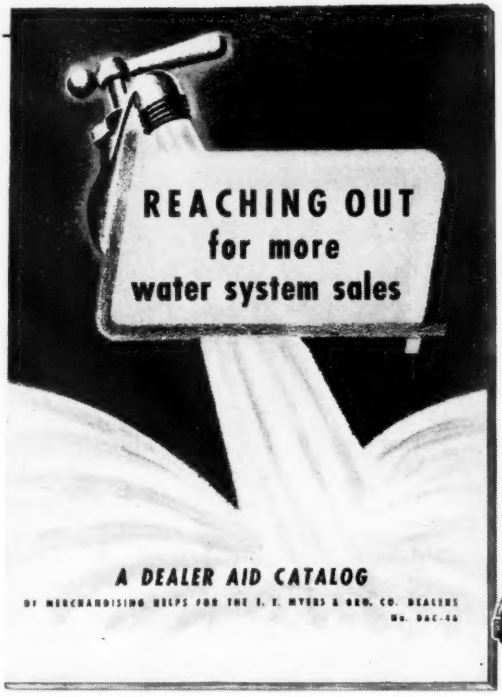
During his 47 years in the well contracting business, Mr. Goldbeck witnessed the progress of water well drilling from horse and steam power to present-day equipment and had the progressive faculty of changing with times. Besides being active in the state drillers association, Mr. Goldbeck was widely known as an authority on draft horses and combined this hobby with his drilling business to make a host of friends throughout the state.

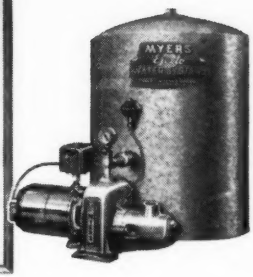
The business will be carried on by his son, Beck, who was partner with his father in their work.

Buy Savings Bonds

IN cooperation with the U. S. Savings Bonds Division of the Treasury Department, THE DRILLER urges its readers to prepare for the future by investing in Savings Bonds. Buy now!

Now, A COMPLETE NEW PROGRAM
FOR MYERS DEALERS!





We've told you about Myers new Sign Program, with signs of many kinds available to Myers dealers. Now a complete 5-section Dealer Aid Program is ready, with all material for dealer's use. It is fully described and illustrated in a colorful, new 44-page catalog brimful of sound, workable ideas. Covers store arrangement, fixtures and displays—outdoor and indoor signs—truck and window decals — retail advertising — customer and prospect record forms—and proved merchandising suggestions. Complete material, now ready to work for you, is illustrated in each section of the book. Your copy will be delivered personally.

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NEWS OF THE MONTH

DRILLER FLIES TO SCOUT WELL SITES

• May is pictured alongside his new plane which he now uses in his water well contracting work. He is shown shaking hands with the agent who delivered his contract for the aircraft.

HAROLD D. MAY, retiring president of the Florida Well Drillers Association, is all up in the air about his new water well drilling venture. This is to be taken literally as May recently purchased his own plane and now flys over a prospective well location to determine if there are any possible fault formations.

"Last fall my company lost around $5000 on wells at Lake Wales, Florida, because we had not seen a sink hole near by before drilling," May said. "If we had flown over this spot beforehand, this costly mistake could have been avoided."

May, who employs four rigs and 13 trucks in putting down an average of 100 wells yearly, interested a former Army pilot in working for him and now they fly over proposed drilling sites so as to determine the best place to drill by locating faults in the earth's formation. They look for a line of sink holes where rock formations have melted or dissolved. When this happens, upper surface formations sink to lower formation levels. All well water in Forida comes from rock formations.

May has been extremely successful in his new, streamlined manner of searching for water. His main customer is the citrus industry, which

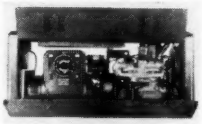
requires more than 80% of his work. Most of the grove owners demand wells producing from 1000 to 2000 gallons of water per minute. Hence, the majority of May's wells must run at least 12 inches in diameter and range in depth from 700 to 1400 feet. It takes a lot of scouting to find wells to meet these requirements for the water table in Florida is falling, eliminating many lakes.

Now sole owner of the May Brothers Well Drilling Co. of Tampa, May started his career in 1929 with a well drilling operation inherited from his father. By hard work and careful management he had progressed by 1936 to the point where he disposed of all original tools and equipment and replaced them with modern facilities and a fleet of trucks.

In 1941 expansion of the business required the opening of an up-to-date office and warehouse. Prospects for the future are sufficiently bright to warrant replacement of present equipment with still more modern facilities plus a substantial extension of operations.

Compact Welding Unit On Market

A COMPACT combination drive welding machine consisting of a standard 300 Ampere generator and 20 h.p. induction motor mounted on a shaft coupled to a Chrysler 6-cylinder industrial engine through an over-running clutch coupling has been announced by The Hobart Bros. Co., Troy, Ohio.



The coupling allows the gasoline engine to drive the welding generator positively; however, should the gasoline engine be stopped and the generator be driven by the electric induction motor, the clutch will over-run, or free wheel. This unit on a portable mounting is very adaptable to those who have equipment spread out over large areas where power conditions may vary. Either used with electric power when available or run by gasoline motor, the unit loses none of its efficiency.

Making Wire Rope

THE recent issue of "Ropeol'ogy," folder of the MacWhyte Co., makers of wire rope, presents a pictorial layout of the method used in the manufacture of wire rope. The steps in the making of the rope from winding the processed wire to the finished product are clearly illustrated and enumerated.

Featured on the front page is a chart explaining how new uniform terms adopted for wire rope centers or cores are applied.

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AURORA DEEP WELL TURBINES
are available in sizes of 4" to 24" for every pumping condition—oil or water lubricated. Streamline designed for highest efficiency and longest life.
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for SHALLOW WELLS
We also make all Kinds of Centrifugal Pumps and Jet Pumps
Write for Descriptions
AURORA Always PUMPS
AURORA PUMP COMPANY
58 Loucks St., Aurora, Illinois

New Mexico . . .

(Continued from page 6)

One of those jobs that every driller dreads befell the Southwesterner back in 1927 when he had a contract to put down a well for the Peru Mining Company, Hanover, New Mexico. That part of the country was known to contain much limestone and Childress did not expect to run into too much trouble in puting the hole down. However, when he began drilling he found very little limestone but plenty of garnet.

The going was so tough that he could cut but four inches with one bit before having to change to a sharp tool, the bit face in use having been flattened out almost straight by the hard rock. And he was able to put down just 18 inches of eight-inch hole in 12 hours! Even against such odds, Childress stuck on the job 40 days before finally throwing in the towel. He admits that he was just plain licked on that one.

The old saying that a person has to go out of his own hometown to gain recognition for his work backfires in the case of Childress. He has had his 24-L working constantly for the town of Silver City during the past year and has put down some good-sized wells. One pumped only 55 gpm. at a depth of 400 feet, so Childress went down to 1395 feet before he found the kind of water he wanted. The last four wells he drilled for the town put out a combined total of 900 gpm. and vary from 547 to 597 feet in depth. All four are 15½-inch diameter holes and are cased with 12-inch casing. Childress thinks he did a "pretty good job" in setting 600 feet of 12-inch 50-lb. casing with a ⅝-inch line and a single block. In all, he has drilled 13 wells for the city amounting to 5,724 feet in depth. The regard that the city fathers hold for Childress is shown by the fact that all contracts regarding the work were verbal.

Uses a Bumper

Lee has an interesting comment to make concerning fishing jobs. Since he has been fully responsible for tool joints, bits and cables, he has had no fishing jobs. He very seldom runs jars but uses a bumper when he gets stuck. Using a small string of tools for a bumper, he has had 100% success with very little bumping needed. The convenient hoist and brake arrangements on the 24-L make this bumper setup excellent, Childress says.

Alertness on the job and the practice of running good bits and cables at all times are big factors in the success of Childress. "I hang on the line quite a bit, and hanging on has paid off for me, too. I have avoided several fishing jobs by noticing the

Recognized leaders in the pump industry for over 31 years . . . Duro products are better than ever. *You* can enjoy greater profits with the quality Duro line.

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DURO PUMPS, SOFTENERS & WATER SYSTEMS

The DURO Company, Dayton 1, O.

Division of Hydraulic Machinery, Inc.

drilling line beginning to break when too much slack appeared without a normal reason."

In conjunction with the drilling of water wells, Childress has further aided his customers by installing over 100 windmills on various farms and ranches in his area.

Kaufman Company Takes New Name

ANNOUNCEMENT has been made that The Kaufman Company of Los Angeles, Calif., is now operating under the firm name and style of Drilling & Mining Equipment Co. This change was made effective October 1.

Until the decease of Mr. Harry C. Kaufman, which occurred on December 14, 1945, The Kaufman Company enjoyed over 30 years of successful business in the drilling equipment field. The same established lines are represented by the new company which will remain a distributor for Bucyrus-Erie oil, gas, and water well drilling machinery. Mr. E. W. Young is in charge of local stocks and the tool division.

New Catalog Insert

A NEW water softener catalog insert, Bulletin 46, has been issued by The Duro Co., Dayton, Ohio, for general dealer distribution of Duro water softeners, iron and sediment removal filters, alkalinators and carbon-type filters.

Besides including one page of suggested sales help for the dealers, the bulletin is accompanied by a complete retail price sheet covering all models listed in the folder. Upon request, the insert will be mailed to appliance dealers, plumbing or hardware dealers, and water well drillers.

MORE PROFIT PER JOB WITH . . .

For shallow drilling. You get more hole at less cost with Macwhyte "Hi-Lastic." You finish the job faster—at more profit. "Hi-Lastic" on your drill means the bit turns better on all types of formation. There's less tendency for the hole to get out of round, and for the bit to channel. You can make a longer stroke, carry tools higher. "Hi-Lastic" is internally lubricated. No manila cracker needed.

For profitable deep well drilling. Macwhyte Standard Cable-Tool Lines are specially designed with just the right elasticity to strike long, hard, sharp blows.

For fast bailing. Use Macwhyte Sand Lines. Coarse laid (6 x 7) or soft laid (6 x 19), Mild Plow steel.

MACWHYTE COMPANY 50th Year 1896 – 1946

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FROM THE MAILBAG

This page is open to any of our readers having questions to ask relating to drilling, driving pipe, dressing bits, etc. All letters will be answered promptly by experienced drillers and engineers who are qualified to give intelligent advice on these subjects. We will publish as many letters of general interest as space will permit. Address: The Driller, South Milwaukee, Wis.

Sirs:

I am drilling in the Laurentides Mountains and my particular problem is as follows: I am drilling a well for a client who wants a well of at least 50 Gpm. After going through 60 feet of boulders and quicksand, I hit blue granite rock and went down in that 200 feet where I got water, but only 25 Gpm. So I continued to drill further until I am now down to 480 feet without getting any more water. I am at loss whether to continue drilling or to quit. What do you advise?

Que. F. L.

Though you did not indicate the size of the hole you are drilling, we note you went through 60 feet of earth and quicksand, also boulders, hitting granite rock into which you drilled 200 feet and hit 25 gallons of water per minute at 260 feet. Your customer, you write, wanted 50 Gpm. and you went to a depth of 480 feet but did not get any more water.

Presumably, with the exception of the 60 feet of earth, boulders and quicksand, the balance of the drilling was in blue granite. In general, granite is not a heavy water producer. The granite wells which show the largest capacity are generally those which penetrate a bed of gravel or till. The reason for this is the water from the overlying formation will drain down through the joints and cracks and thus keep the supply in the rock constant.

New Well Advisable

Accordingly, as these joints and cracks are as a rule most numerous in the upper part of the formation, it is not considered good practice to drill deeper than 300 feet in the granite. Thus, if water is not struck in a great quantity when a depth of 300 feet is reached, it will usually not pay to go any deeper or it is advisable sometimes to start a new well a few feet from the old one in an effort to strike new joints which are better water bearing. Sometimes a certain well might miss a water-producing joint while a well a short distance off will be a good producer.

We do not believe, therefore, it would be advisable to go any deeper with this well as the chances are you won't get any more water production than at the 260-foot depth.

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Drilling Cable

Especially designed with plenty of spring for water well and blast drilling — also lubricated to minimize internal friction.

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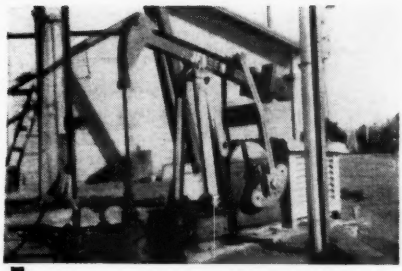
Early Settlers . . .

(Continued from page 9)

looked like a good road. Suddenly one of his horses seemed to step down into a low spot. Sensing that something was wrong he got out of the wagon and walked along the side of the team to be sure the road was all right. Suddenly without a moment's notice he became aware that he had stepped into an old deserted well and was dropping through space into the bowels of the earth. With a prayer on his lips he placed his feet together and prepared for the end. When he struck the bottom, the mud and water completely covered him. He was stunned but able to raise his head above the water, and, extricating his feet from the mud, stood on his feet arm-deep in the cold water. The well was curbed with wood and he managed to break off a piece at the bottom large enough to place in a crack of the curb; perching himself on it, he sat there until morning. While there one hundred and forty-three feet below the surface, he heard his team running away. In the horses lay his only hope of escape for no one knew he was there and the nearest house was a mile and a half away. In the morning by the light of day he noticed that the slimy wooden curb did not extend to the top. There was a place from six to sixteen feet curbed and then a place without any curb. The curbing was plastered with mud and there was not a crack where he could get his fingers in. He searched for his knife and began cutting footholes in the side of the curbing. When he got to the top of the curbing he took the board broken loose and made a seat. By this method he crept up fifty feet the first day. In the afternoon he came to a curbing which he thought he could not get through. It was



Pump Handle Pete Says:

Gol Durn Coyote . . .

Guess I'm goin' to have to shoot that critter. Busted into the hen house last night an' stole Maw's prize hen.

One thing that 'onry critter can't do is run away with my JENSEN Water Well pumping unit. It's sturdy an' dependable an' it will be runnin' a long time after he's dead.

Nothin' can bother your water supply if'n you have a JENSEN so, see your dealer to-day or write us givin' his name an' address. Won't cost you nothin' for some good ideas . . .

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solid one by six inch material and fitted together so closely that he could not get a handhold. He stayed there all night and all of the next forenoon calling for help. One foot injured in the fall was paining terribly and he had to do most of his climbing on the other foot. Resolving to gain the top he finally decided he must make a desperate effort or die. Taking some sand, he placed it on a board, sharpened his knife, and, by alternately cutting and climbing, reached the top of the difficult curb. When within sixteen feet of the top he encountered his greatest difficulty. It was a round curb perfectly smooth and four feet high. Water had washed the dirt away from behind it until it was held in place only by a peg on one side. His only chance was to crawl up between the curb and the wall. In a half hour he had dug a hole large enough to let himself through and shortly afterward reached the top where he lay exhausted. The team had been found the day after he fell into the well and the finder took them to the justice of the peace, filed an estray notice, and turned them loose in his pasture, thus complying with the law and destroying the last chance of rescue for the unfortunate man in the well. By good fortune and a great determination the apparently doomed man, with a sprained ankle and a broken rib, had climbed to the top and painfully made his way to safety. Few men have survived such a harrowing experience.[2]

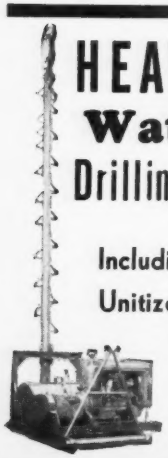
Ten Dollar Wells

In some parts of the country it was possible to drive a well. A company patented such a scheme and charged the settler a royalty for using it. The price was ten dollars for each well.[3] The principle was that of driving a sharp-pointed pipe into the ground and adding lengths as it was driven. When the point struck sand which was filled with water a pump was placed on the top of the pipe.

Another type was the bored well. These were put down in two different ways. The most common way was to drill the well with an expensive machine. The cost of the process varied with the difficulty of the job but it was quoted at one dollar a foot in some places in the seventies. Another method was that of using a common post auger. By lengthening the handle of the auger as necessary it was possible to dig a "post hole" perhaps fifty feet deep and secure a supply of water. The hole was then "cased" to keep it from caving in.

[2] S. D. Butcher, *History of Custer County*, p. 314.

[3] *Nebraska Farmer*, January, 1880, p. 3.



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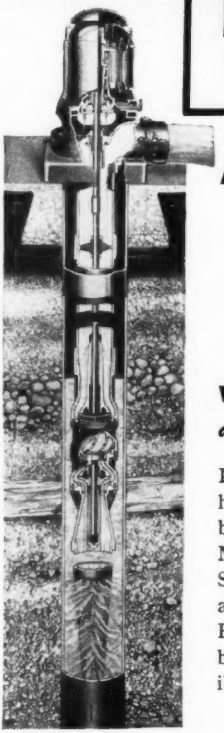

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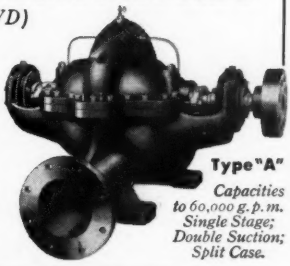

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WIT BITS

Driller: "Boy, am I scared. I just got a letter from a man telling me he'll shoot me if I don't stay away from his wife."
Friend: "Well, why don't you?"
Driller: "He didn't sign his name."

Bartender: "That whiskey, sir, is 20 years old."
Customer: "Rather small for its age, don't you think?"

Cop: "I ought to arrest you for driving like that."
Sweet young thing: "But, officer, you can't arrest me. This isn't my car and besides I haven't any license."

The older generation thought nothing of getting up at 6 in the morning. We can assure you the younger generation doesn't think much of it either.

He: "I can't see what keeps you girls from freezing."
She: "You're not supposed to."

Dear Old Lady: "Little boy, does your mother know that you smoke?"
Junior: "Listen, lady, does your husband know you speak to strange men on the street?"

Guest: "Look here! How long must I wait for the half portion of duck that I ordered?"
Waiter: "Till somebody orders the other half. We can't go out and kill half a duck."

She: "Exercise loses fat."
He: "Nonsense. Look at your double chins."

New Bride: "No, I really can't say that Jack is very religious, but he always observes that feast—I think it's called the 'hangover'! "

Student: "Do married people really live longer than single ones?"
Professor: "I'm not sure, but it seems longer."

The teacher wrote on the blackboard: I didn't have no fun last night. Then she turned to the class. "How can I correct this?" she asked.
"Learn to dance and get a boy friend," chirped a small girlish voice.

Judge: What's the charge against this man?
Officer: Stealing nine bottles of beer, your Honour.
Judge: Discharged. I can't make a case out of nine bottles.

Man Motorist (barely avoiding broadside crash): "Why on earth didn't you signal!"
Girl (who had crossed into her home driveway): "I always turn here, stupid."

An old maid with her hair in curlers and a faded robe fluttering behind her rushed out and hailed the garbage truck.
"Yoo hoo! Am I too late for the garbage."
"No, ma'am, jump right in."

Wife: "I had to marry you to find out how stupid you were."
Husband: "You should have known that when I asked you."

New Unit Designed To Control Pump Automatically

A NEW automatic control called the Protectrol is designed to prevent deep well or centrifugal pumps from running more than a predetermined interval without discharging water. Mechanical failure, lowering of the water table, or any other cause for water not being discharged will stop the pump and keep it from restarting until the Protectrol has been manually reset.

The unit is mounted in the pump house and connected directly into the pump discharge on the pump side of the check valve where it is readily accessible. The Protectrol, according to the release, also provides additional protection over that afforded by the electrode scheme in that it will not only sound an alarm but definitely stop the pump should water fail to be delivered for any reason. For example, should mechanical failure occur in the impeller section of the pump even though the water table was at the proper elevation, the Protectrol will guard the pump.

In addition to its broader scope, the control definitely locks the pump out until it is manually reset, thus should trouble occur, regardless of the fact the primary control continues to call for pump operation, the pump cannot be started until the trouble is investigated and the Protectrol is manually reset. Should the unit be reset without the trouble actually being corrected, it would immediately repeat its operation and again lock the pump out and resound the alarm.

For further information write Automatic Control Co., St. Paul 4, Minn. and ask for literature regarding the unit.

Monitor Windmills are designed to reduce storm strain instead of fighting it. That is why they can ride out most storms without damage.

An automatic wind governor keeps the wheel from excessive speed regardless of wind velocity. The wheel cannot run wild even in a storm.

All working parts of the Monitor Windmill head are carefully machined and set at the proper angle to reduce friction. Automatic lubrication eliminates the need for constant care. Iron Vault gear case keeps out dust and moisture.

You can build a profitable business in windmill sales and service by promoting the Monitor line.

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Bargain Counter

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DRILLS FOR SALE

Ferguson solid tool drill, all steel except mast. In fair condition. Trailer type, rubber tires, good LeRoi motor, some tools. Priced to sell. J. J. Olsen & Son, Belmond, Iowa.

Spudder. 250-ft. capacity. Mounted on rubber. Complete with tools for drilling 4" and 6" wells. Price, $500 cash. Call 333 or Box 416, Mukwonago, Wis.

24-L Bucyrus-Erie and No. 3½ Keystone machines. Both in excellent condition and well equipped. Bucyrus-Erie $6000 to $8000 and Keystone $2000 to $3000, according to equipment wanted. Box 146

DRILLS FOR SALE

Drill rig used for prospecting coal land, drilling deep wells, and drilling blast holes for rock quarry work. It is equipped with a 30 ft. drill hoist boom, and powered with a LeRoi gasoline industrial motor mounted on a good 4 wheel hard rubber tired chassis, complete with all drilling tools, bits, casings, drill steels, and earth sockets. Complete, ready to go. This machine is in excellent operating condition with new coat of paint priced to sell. Looks like new.

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One coil (275 ft.) 1¾" left laid American drilling cable, pure manila. Box 474, Woodbury, N. J.

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Rubber tired trailer mounted pumping unit. New, six cylinder Chrysler engine, capacity 500 GPM 120 lbs. discharge pressure. Also skid mounted unit. Long Island Water Supply Co., Inc., Syosset, Long Island, N. Y.

Large assortment of drilling tools and miscellaneous equipment including steel derricks, etc. Box 149

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Want to buy modern rig in good condition capable of drilling 16 in. water wells to a depth of 400 ft. Prefer purchase in Texas, New Mexico or Arizona. Please give full information and send picture of machine to: S. G. Brown, Colonia Dublan, Chih., Mexico.

A good rotary rig capable of drilling 1000 ft. Would prefer Failing, Franks, Sullivian or any other equal make. Please give price and condition. Leslie Swick and Sons, 602 Ash St., Gordon, Nebraska.

Bucyrus-Erie 21-W or what have you for 150 ft. wells. Will pay cash. L. LaRochelle, 1929 N. St. Louis Ave., Chicago, Ill.

Bucyrus-Erie 24-W or 24-L or similar late model Star Spudder. Must be in A-1 condition. Write C. G. Keyes, Roswell, N. M.

Bucyrus-Erie 33-W, 21-W or similar steel rig. With or without truck and tools. H. L. Jones, R. 10, Fairfield, Conn.

Wanted: Bucyrus - Erie 21-W, 22-W or Keystone 70. J. M. Gillaugh, Carlisle, Penna.

Wanted: Experienced drillers for water well drilling in Michigan and Ohio. Excellent proposition. Box 148

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Missouri Ground Water Supplies Are Discussed

"GROUND Water Supplies in Missouri," authored by John Grohskopp, Assistant State Geologist, Missouri Geological Survey and Water Resources, has recently been issued in pamphlet form. After stating that Missouri is divided into four ground water provinces based upon the quality of the water and the aquifiers from which the water is derived, Grohskopp, in this the first of four papers, discusses the northwest section of Missouri known as province 1.

This region in general character has fresh water in the unconsolidated sands and gravels of the glacial drift and stream alluvium. Mineralized water is found at most places in the underlying bedrock according to the author. An accompanying chart shows the typical geologic columnar section of this province and the generalized character of the water in each group of rocks.

Following the data given on the Pleistocene period during which huge ice sheets or glaciers occupied most of northern Missouri, Grohskopp tells of the formation of the various strata formations by the movement and melting of the ice. It is also noted that the major preglacial valleys and their larger tributaries offer the best localities from which large supplies of fresh ground water may be expected.

In the inter-stream and upland areas, Grohskopp points out, the glacial drift is usually thinner and may not contain well developed sand and gravel beds, though a sufficient supply of water for ordinary use may be usually obtained.

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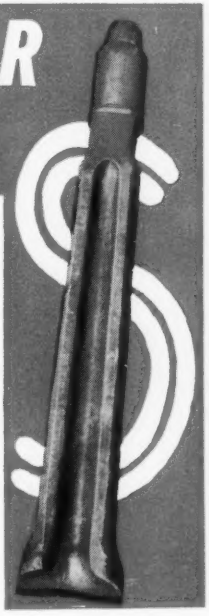

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FOR MONTH OF

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Drilling In New Mexico Has Its Headaches 4
Drilling in New Mexico's lava rock country presents many tough and unusual problems, but Lee R. Childress has conquered enough of Nature's obstacles to rank as an outstanding driller in his territory.

•

The Early Settlers Had Water Problems. 7
The early pioneers' struggles and hardships to secure potable water for their communities played an important part in the building of a nation. Present day drillers should find this tale both interesting and informative.

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